Intel Microcontrollers Do Fuzzy Logic!

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Two complementary technologies are being enlisted not only to solve new classes of applications but also to re-address existing applications. Neural networks and fuzzy logic enable designers to solve problems more simply or quickly than conventional methods in many cases. These two technologies will not replace conventional control methodologies, but instead will extend the capability and functionality of systems. This article introduces fuzzy logic; future articles will discuss fuzzy theory and how it can be used in microcontroller design.

Both fuzzy logic and neural nets are natural extensions of conventional controller design methods. They are both mapping techniques that can simplify and shorten the development time of the application-specific algorithms used by conventional controllers. Fuzzy logic is a linguistic approach to code generation that allows system designers to work at a high level of abstraction. Fuzzy systems do not require a mathematical model for input-output relationships; instead, the relationships can be described with relatively simple statements or rules. Fuzzy logic uses rules in a semi-natural language format to perform the control function. These rules are provided by a domain expert. This freedom from algorithm development enables system developers to operate at a higher level of abstraction, leading to shorter development cycles.

Incorporating fuzzy software on the microcontroller offers several advantages over dedicated hardware solutions: integration, familiarity with a standard architecture, and performance. This is the solution available for the Intel microcontrollers. Inform Software has created fuzzyTECH* tools for developing fuzzy systems based on the MCS®-96 and MCS®-51 microcontroller family lines. The fuzzyTECH MCU-96 and MCU-51 tools include Graphic Design Editors, an Offline Simulator, and Real-time Code Generators. Graphical tools are included for all development steps: design, optimization, and verification. The Offline Simulator supports interactive debugging, real data simulation, and model simulation. Real-time Code Generators provide either ANSI-C code or Assembly code optimized for the microcontroller. The fuzzyTECH tools provide an easy method for developing fuzzy logic on Intel microcontrollers. For more information on the tools, please contact the developer:

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* fuzzyTECH is a trademark of Inform Software Corp.

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